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AGO, D/A ltr, 29 Apr 1980

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Revised  
29 July 1969  
5 March 1969

IN REPLY REFER TO

AGAM-P (M) (24 Feb 69) FOR OT UT 684340

SUBJECT: Operational Report - Lessons Learned, Headquarters, 46th  
Engineer Battalion, Period Ending 31 October 1968

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2. Information contained in this report is provided to insure appropriate benefits in the future from lessons learned during current operations and may be adapted for use in developing training material.

BY ORDER OF THE SECRETARY OF THE ARMY:

*Kenneth G. Wickham*

KENNETH G. WICKHAM  
Major General, USA  
The Adjutant General

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DEPARTMENT OF THE ARMY  
HEADQUARTERS, 46TH ENGINEER BATTALION  
APO 96491

EGBB-CO

13 November 1968

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65) for Quarterly Period Ending 31 October 1968

THRU: Commanding Officer, 159th Engineer Group, APO 96491  
Commanding General, 20th Engineer Brigade, ATTN: VBI-OPN  
APO 96491  
Commanding General, United States Army, Vietnam, ATTN: AVGC-DH  
APO 96375  
Commander in Chief, United States Army, Pacific, ATTN: GPOP-OT,  
APO 96588

TO: Assistant Chief of Staff for Force Development  
Department of the Army (ACSFOR DA)  
Washington, D.C. 20310

## 1. Section 1, Operations: Significant Activities.

a. Command: LTC Pendleton A Jordan III commanded the 46th Engineer Battalion during this period.

b. Headquarters Company conducted the following activities during this period:

(1) During this quarter the Carpenter Shop came under the control of Headquarters Company. Also the utilities section began construction of their new shop next to the carpenter shop. The concept being that the utilities section and the carpenter shop will be able to coordinate their operations.

(2) Throughout the company area efforts continued during the monsoon season to complete new headwalls and stabilize the soil.

(3) The Vietnamese employees during this quarter continued their high productive rate. The Vietnamese structure in the battalion is planned to be reorganized into a Vietnamese Construction Company. The company will consist of three platoons, each platoon capable of performing separate construction tasks.

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(4) A new program, whereby Vietnamese will replace military positions, was initiated in August. Under this new program the battalion will receive 306 skilled Vietnamese. At present these personnel are gradually arriving and are being utilized throughout the battalion.

c. Company A conducted the following activities during this period:

(1) During the past quarter the Company continued its mission of equipment and maintenance support for the 46th Engineer Battalion and attached units. Limited equipment support was also given to other Battalions within 159th Group and to the ROK and Royal Thai Armies.

(2) Normal 3rd echelon work was performed. Maintenance support of the Bien Hoa Quarry continued on a lesser scale than during the previous quarter.

(3) Due to a change in repair parts supply procedures, the technical supply section underwent a complete revision. Many ordnance parts were deleted from the ASL. Engineer repair parts are now being obtained directly from Field Depots. The ordnance parts are being requisitioned by the individual companies through the 185th Maintenance Battalion. A new internal SOP is currently being revised to conform to a standard throughout the 159th Group.

(4) In preparation for future CMI's, inspection teams were organized and all companies and attached units were given a CMI type inspection to find problems and mark possible corrections.

(5) The welding section continued various projects in Battalion support. Bearing plates, sole plates, and rollers were fabricated for 2 bridge projects. Eight chain link gates were constructed for LBP Gate #2. The welding section also completed rebuilding a damaged sandbagging machine.

(6) The equipment section accomplished numerous hauling assignments. Bridge materials were hauled in support of the ROK Engineers. Convoy support of 169th EBC was a significant accomplishment, over 10,000 miles. The operator of the high speed combat entrencher spent one week training the Royal Thai Engineers in proper operation and operator maintenance of their Barber Greene entrenching machines.

d. Company B conducted the following activities during this period:

(1) The first month of this period was devoted entirely to Operation Dong Tam, a combined U.S. and Vietnamese engineering effort of which B Company was an essential part. This project was initiated as a result of the enemy's May Offensive. Approximately 15,000 homes were destroyed in the city of Saigon and neighboring province of Gia Dinh. The mission of this task force, which began on 20 May 1968, was to prefabricate and issue a total of 2,500 refugee housing units. 1,500 of these units were to be erected by personnel of the task force while the remaining 1,000 were to be

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issued and erected by the city of Saigon and Gia Dinh. By 7 August 1968 1,500 of these units were prefabricated and erected. The pre-fab shop continued to work on the additional 1,000 units which were to be issued to the Vietnamese after vertical construction was finished. Water distribution points for the new units and roads in the area were completed by 4 September 1968. Final electrical wiring was completed on 5 September 1968 and the main element of the company began the move back to Long Binh.

(2) The First Construction Platoon remained in Saigon to complete commitments assigned them in the Saigon area, in support of the Capital Military Assistance Command.

(3) The first of these projects was the construction of a radar tower and bunker complex, south west of Saigon. The tower was 34 feet high with a concrete platform and protective concrete walls which housed a radar scanning screen. The bunker was a modified 20' x 20' communications bunker erected to the specifications necessary for the radar complex to function properly. Over 4,500 sand bags were utilized to assure the greatest protection from enemy rocket and mortar fire.

(4) The Second Construction Platoon was also given a mission in coordination with CMAC. On 16 September 1968 construction began on high wall revetments around the communications facility adjacent to the GOQ at CMAC. No problems were encountered in the construction or erection of the 143 linear feet of revetments. However, the unavailability of a front loader caused some delay in filling. When the project was completed on 3 October 1968, the communications facility was assured much greater protection from enemy action.

(5) First Construction Platoon began construction of a CMAC Communications Building on 13 September 1968. Scope of work included construction of a 20' x 48' Pascoe building with an adjoining 20' x 20' annex. Ceiling and floors were to be tiled and air conditioning units installed. Changes came down from higher headquarters which caused a work stoppage. To date the exterior portion of the building is completed. Interior walls have been completed (paneled). Air conditioning units and recessed ceiling lights have been installed. Completion of the project is expected by 16 November 1968.

(6) The Earth Moving Platoon began work on an access road for the 2/40 Artillery on 11 September 1968. The 300 meters of road to be surfaced required large quantities of 6"(-) rock to fill holes. To date over 700 cubic yards of rock have been used on the road. The final surfacing of the road, to include grading and compacting of laterite, is to be completed by 16 November 1968.

(7) The Second Construction Platoon began work on an Advisor Housing project on 26 September 1968. Three 12' x 24' concrete block houses

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were constructed to provide living areas for American advisors to the Vietnamese. Each house has a concrete floor and asbestos roofing. A 15 foot high water tower was constructed to provide potable water. An eight head shower and an eight hole latrine were prefabricated by the carpenter shop and erected by the 2nd platoon. The earth moving platoon also had a part in this project. Before vertical construction could begin 12,000 cubic yards of laterite were used to bring the proposed area up to grade.

(8) The security element guarding the Newport Bridge did not have adequate protective bunkers. The first construction platoon erected eight fighting bunkers on the bridge. These bunkers were prefabricated at the carpenter shop and then transported to the bridge site. Also included in this project was the construction of a tower bunker.

(9) The first construction platoon was also given the mission of bridge lighting in the Saigon area. Included in this project was the installation of flood lights, and the maintenance of generators on eighteen bridges in the Saigon area. Two crews were set up to handle this twenty-four hour a day task. Each team consisted of a generator mechanic and electrician, with a contact truck at their immediate disposal. In that these bridges are vital links of communications between Saigon and the surrounding area, this mission has become increasingly important and demands prompt attention.

(10) The earth moving platoon has begun hauling 6"(-) rock to be used on roads for the 82nd Airborne M&R project. To date they have hauled 788 cubic yards of rock. The second construction platoon will also take part in this project when the earth moving segment is far enough along to allow construction to begin.

(11) The second Construction platoon was responsible for the erection of the Vinnell power plant revetments. Work on this project was stopped while the company was involved in Operation Dong Tam. Upon return to Long Binh, work was started. A problem was encountered in filling the 11 foot high revetments. Since a front loader was unable to fill them, a belt was required to complete the job.

(12) Another of the second construction platoon's projects was that of removing inadequate and worn helicopter revetments at IIFV Aviation unit. These were replaced by newly constructed and filled revetments. A great portion of this work was done by Vietnamese skilled labor under the supervision of U.S. personnel.

(13) The Second Construction Platoon was given a priority project to prefab 1320 linear feet of standard revetments. Using the company area for prefabrication, the men of the second platoon successfully completed the construction of these revetments in five days.

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(14) While the second platoon was involved in this rush project the company was in the process of relocating itself in Saigon. Due to commitments that will warrant large work forces and immediate action it was found more acceptable to have the company moved. The billeting area which is now being used was not in use for over a year before the arrival of this unit. A great deal of work was done to prepare the area for the arrival of the main element. Plumbing and electrical facilities which were in poor condition are in the process of being upgraded. The maintenance section had to build their own tent frame stall area and are now in the process of constructing a permanent grease rack. 2"(-) rock is now being used in the motor pool area to provide adequate drainage.

e. Company C conducted the following significant activities during this period.

(1) During the major part of this quarter period, C Company was located at Bear Cat. The projects completed this period included a 4,000 SF Passenger Terminal Building. When C Company took the project over from D Company 93rd Engineer Battalion, the outside walls and roof were already constructed. Remaining were the doors, side panels for 6 offices, a snack bar and PX area. Benches were constructed and electrical wiring, light fixtures and ceiling fans were installed.

(2) The Quan Tre Bridge, a class 60 steel stringer bridge with a timber deck was inherited from B Company 46th Engineer Battalion and completed. The far shore abutment was poured, 4 steel stringers placed and 12" x 12" timbers used for the decking. Walk ways on each side of the bridge were installed. 214 CYs of concrete was used in the construction of the abutment.

(3) Bear Cat Bridge was originally built by C Company and when enemy forces blew up one span of the bridge, the task of replacing the demolished span was given to C Company.

(4) A 35,350 SF Aircraft Maintenance Hanger, bordered on three sides by a 9,000 SF technical supply building was completed during this period. A Company, 93rd Engineer Battalion had erected the steel frame and C Company completed the siding, roof, sky lights, and 2 ea three panel sliding doors. Company C also completed the front siding, doors, windows, room dividers, electrical wiring, and lights for the Tech Supply Building.

(5) A cantorment area was built for the 224th Aviation Battalion. This area consisted of 6 each pads 20' x 60', 1 ea 40' x 100' and 1 ea pad 100' x 200'. 9,500 CYs of laterite were placed, graded and compacted.

(6) A 200 SY parking area for aircraft at Long Thanh North Airfield was constructed using a soil - cement base of 8%. A grader was used for uniformity in spreading and a disc plow was used for proper mixing. An optimum moisture content of 13.5% was attained and the 13 wheel and 50 ton pneumatic rollers were used to seal off and compact the soil - cement base. A final cut by an experienced grader operator was able to complete the project in only two passes.

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(7) A 64' x 30' chapel for the 210th Aviation Battalion was transferred from D Company 93rd Engineer Battalion. The concrete pad was already constructed and C Company constructed the building itself and also installed the electrical wiring, lights and fans. The area around the chapel was graded and landscaped.

(8) A laterite pad for the Officers Field Ration Mess was constructed. 500 CYs of laterite were hauled in, graded and compacted.

(9) C Company was also called upon to furnish operational support to the 210th Aviation Battalion. Thirteen acres of rubber trees were cleared around the perimeter within the short time of 40 hours.

(10) The South Access Road from QL-15 to Bear Cat was upgraded by C Company. 1400 CYs of laterite were hauled, graded and compacted.

(11) An MER for 303rd Trans Co (Avn) was constructed by C Company. A 40' x 100', three hundred man messhall was placed using 80 CYs of concrete. A laterite parking area and 1.3 miles of road were constructed using 28,000 CYs of laterite. Before the laterite could be hauled in, graded and compacted, 15,000 CYs of mud and spoil had to be hauled out. A total of 240' of culvert of various sizes was placed to conform to the overall drainage plan of Long Thanh North Airfield.

(12) Four LOC Interdictions on QL-15 were repaired using 60' of 60" culvert, 80' of 36" culvert, 40' of 30" culvert and 1,300 CYs of laterite.

(13) C Company completed work on the Soui Nouc Trong Bridge this period. Three culverts were installed. Each one was 54' long with a 60" diameter. The footers for each of the two headwalls were precast. A total of 160 CYs of concrete was used for the headwalls and footers. An abutment was constructed on the site so that when the security of the area improves, a class 60 bridge can be constructed there.

(14) During the last part of October Company C moved back to the 46th Engineer Battalion area in Long Binh. This was accomplished over a period of six days. An advance party from the 1st Vertical Platoon was sent ahead to ready the company area. From lessons learned when the company moved to Bear Cat it was decided that the company would be moved in sections so as not to seriously affect its construction capabilities.

(15) As the company completed projects in the Bear Cat area it started new projects in the Long Binh, II Field Forces area. One of these projects was to construct revetments for the II Field Forces Dial Central Building. The revetments were wood framed with corrugated metal siding.

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(16) A 12' wide Access Road to a fire support base near Hoc Mon was started by a squad from the Earth Moving Platoon. To date 800 CYs of 6"(-) rock has been hauled to the site. When completed, it will provide access to the base all year around.

(17) In support of a combat unit's move, C Company prefabricated 480 IF of 98 high revetments. The revetments were made from M8A2 matter 3" angle iron. Also prefabricated were ten command post bunkers, and 35 each 12x20 eight head showers.

(18) An access road was completed by the Earth Moving Platoon. 3,600 CYs of laterite were placed and compacted. 350' of various size culvert was installed to conform with the drainage plan for Long Binh Post.

(19) During this period approximately 25% of the vertical capability of this unit was attached to a task force in the Mekong Delta which is under the operational control of the Battalion.

f. Company D conducted the following activities during this period:

(1) From 1 August 1968 to 3 September 1968 the First and Second Construction Platoons of Company D completed construction of concrete block ring footers for eighty buildings of operation Dong Tam District 8 Saigon. This task utilized over 16,000 concrete blocks and over 4,000 bags of cements. Additionally over 800 feet of 24 inch culvert and accompanying headwalls were placed to provide drainage for the construction area and neighboring roadways. Plumbing was installed at three worksites in District 8 and one worksite in District 9. A water point consisting of two water faucets and a catch basin with accompanying drain was placed to service every four buildings. About 3,000 feet of three inch water pipe was placed. The Second Construction Platoon installed electrical wiring, lights, and outlets to service all four worksites totaling several miles of wire, and forty telephone poles were utilized in providing the local Vietnamese with electricity prior to the final hook-up with local power.

(2) The Second Construction Platoon was also tasked with furnishing and maintaining security lighting for the Saigon area from 1 August 1968 through 3 September 1968 at which time this task was turned over to Company B. The Second Platoon's efforts were instrumental in providing security and lighting necessary to keep five bridges open in Saigon in support of CMAC.

(3) After returning to Long Binh the Second Construction Platoon started construction on the US-RV Dental Clinic. The job had been started by another company in the Battalion. The 2nd Construction Platoon started work on 10 September 1968. A complete re-evaluation of the facility was necessary since it was found vastly underdesigned when checked against the user's requirements. It was necessary to do the plumbing and electrical wiring again. This facility is about 900 square feet in size and is presently nearing completion. Floor tile was placed in seventeen rooms and acoustical ceiling tile was placed in six rooms. The interior woodwork, walls, and ceilings were completed within the standard metal 40 foot by 96 foot Butler Building. A total of seventeen air conditioners were installed. The above construction has shown that Army construction units have the capability to accomplish complex and sophisticated vertical type construction, however,

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such construction, particularly when dealing with medical facilities is often hindered by the nonavailability of needed materials within the Army Supply System. To meet the necessary requirements substitutions were necessary and where this was not possible, serious delays occurred.

(4) The First Construction Platoon immediately started and completed two 30 foot by 76 foot maintenance buildings for the 48th Transportation Battalion after their return from Saigon. The four bay structure was placed on an eight inch concrete slab. Vietnamese laborers were utilized extensively in the placing of the siding and corrugated roofing, thereby releasing most of the U.S. personnel for duty on higher priority operational support missions.

(5) The First Construction Platoon was nearing completion on the construction of the II Field Force POL Facility at the end of the Quarter. Two 21,000 gallon fuel tanks were constructed on two concrete pads. The accompanying lines, pumps, and filters needed to meet the requirement of twelve fuel points were also placed. As required by safety regulations, a berm was constructed around each tank that will hold one and one half times the volume of the stored fuel. Due to the restricted working area and the nonavailability of the earthmoving equipment, the berm walls were constructed of concrete block, timber and laterite.

(6) A major operational support mission was the construction of a fifty foot radar tower several miles west of Saigon. This unit was given four days from the time they were notified to complete the job. The project was completed in three and one-half days utilizing the First Construction Platoon as a work force and elements of the Second Construction Platoon and Earthmoving Platoon as security. The project was beset by severe design and logistical limitations brought about by road and bridge restrictions limiting vehicular traffic to 2 1/2 ton trucks or less. The tower was designed by the company and constructed entirely by hand utilizing 8x8 and 6x6 columns and beams. All materials were precut before hauling them to the job site in 2 1/2 ton trucks and then were raised by hand utilizing a block and tackle to each surrounding story. This project proved the feasibility of using medium size timbers in the construction of a tower whose height is fifty feet or greater.

(7) Another important operational support project still continuing was the construction of thirty-three each six hole, skid, mounted latrines in the short span of five days to support Operation Liberty Canyon. The company set up its own prefab yard utilizing two twelve inch skill saws. With the saws mounted it was a relatively simple matter to precut all the required materials for the erection crews. The job was worked on a double shift twenty-four hours a day, utilizing both First and Second Construction Platoons. Unusable inner tubing was utilized in lieu of unobtainable metal hinges. Square toilet holes were cut then fitted with factory made plastic toilet seats to increase the production rate.

(8) The Second Construction Platoon placed a security lighting system on the Rach Cat and Cau Ganh Bridges near Bien Hoa. Seventy-six lights were placed to properly light each pier, abutment, bridge span, and waterway.

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(9) A welder prepared the Roll On-Roll Off facility at the Saigon Docks. Twelve wide flange steel beams were utilized to restrict lateral movement of the dock. Three foot sections of the beams were also used as guides connecting the dock to the vertical beams.

(10) The Second Construction Platoon also constructed a forty foot Class 12 Bridge on the USARV Access (Camp Swampy) Road. A dead man anchoring system was utilized to anchor the wooden abutments and sixteen wide flange steel beams were utilized as the stringers. This job was completed in three days.

(11) The First Construction Platoon has begun construction on a 20 foot by 96 foot Technical Supply Building for the 25th Aviation Support Company, two 40 foot by 100 foot, and one 40 foot by 120 foot Administration Building for the 90th Replacement Battalion. Work has also been initiated by the First and Second Construction Platoons on fifteen buildings for 117th and 195th Assault Helicopter Companies. In all above cases a shortage of one inch material and higher priority operational support construction is causing considerable delay.

(12) The Earthmoving Platoon was engaged in extensive horizontal effort during the period of 1 August 1968 to 31 August 1968. A 4,800 foot access road (Camp Swampy) was constructed utilizing approximately 6,704 cubic yards of rock and laterite, and 1,158 cubic yards of sand. A sand blanket was placed over the swamp and then capped with rock and laterite, resulting in a good usable road for all traffic. Four foot deep dozer ditches approximately 1,500 feet long were dug to lower the water table and proved extremely successful. Twenty two 24 inch culverts and two 36 inch diameter culverts were placed for drainage.

(13) Construction was completed on an MER for the 3/17th Cavalry at Di An Base Camp. Five 20 foot by 60 foot pads were repaired and brought up to standard. 550 cubic yards of laterite were hauled for the construction of a berm around their Motor Pool. The second Construction Platoon poured a 20 foot by 120 foot, six inch concrete slab for a mess hall.

(14) Another major horizontal effort was the construction of an artillery fire base at Cat Lai. It involved the construction of six 105mm Howitzer pads, an FDC pad and access road for the 6/15th Artillery. The construction area was about one to two inches above the water level of a near by river. Rock and sand were utilized to build a stable access road and pad areas, and then they were capped with laterite. 2,000 cubic yards of sand, 3,250 cubic yards of rock, and 630 cubic yards of laterite were used.

(15) An MER was completed for the 6th Transportation Battalion. In addition to the erection of two water towers, two 2 head showers, and three 6 hole latrines by the First Construction Platoon, the Earthmoving Platoon constructed a hardstand approximately 500 square feet to serve as a vehicle park. A total of 1,560 cubic yards of laterite was hauled to level and fill in the hardstand utilizing 29QM w/scrapers. A great deal of mucking was necessary since about 20% of the hardstand area was located in a swamp.

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(16) Construction has been started on a Trailer Transfer Point for the 48th Transportation Group. The completed project will be a hardstand of 560,000 square feet and will require about 45,000 cubic yards of excavation and 10,000 cubic yards of fill. In connection with this project, the First Construction Platoon and Earthmoving Platoon placed three 60 inch diameter culverts, each fifty feet long, to repair the existing road to this area.

(17) Construction was completed by the Earthmoving Platoon on the Rach Cat By-Pass to allow placement of an AVLB, if necessary, to maintain traffic to Saigon. Further, the Earthmoving Platoon placed laterite pads for all vertical building construction undertaken by the Construction Platoons.

(18) The Second Construction Platoon, utilizing a five man crew, constructed a twenty foot air portable tower in support of CMAC in three days. The tower was constructed utilizing bolts to insure that it would not pull apart when airlifted to its final location.

(19) Construction was initiated on the 20th Engineer Brigade Aviation Airfield MER. When completed, this project will include a 312,000 square foot helicopter landing and parking area to include eleven helicopter revetments, a 105,000 square foot maintenance hardstand, and the relocation of a portable maintenance hanger 80 feet by 100 feet by 50 feet in size.

(20) The Company also had the responsibility of operating the Battalion Block Shop. During this quarter, 61,189 three hole concrete blocks were produced. These blocks were constructed by an average working force of 56 Vietnamese workers and one GI supervisor utilizing 12 block machines. The Vietnamese workers were organized into a military type organization utilizing squad and platoon leaders. The Vietnamese are almost completely self sufficient with the exception of one GI who coordinates and issues materials.

(21) The Battalion Culvert Shop operated by Company D, using eight Vietnamese laborers, assembled 160 feet of 30 inch culvert, 1,424 foot of 24 inch culvert, 910 feet of 60 inch culvert, 1,500 feet of 18 inch culvert, 1,920 feet of 36 inch culvert, 1,060 feet of 12 inch culvert, and 1,160 feet of 48 inch culvert.

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g. 103rd Engineer Company (CS) conducted the following activities during this period:

(1) The 103rd Engineer Company (Construction Support) was under the Command of CPT William L. Christner from 1 August 1968 to 17 October 1968. On 17 October 1968 CPT Robert C. Rhone assumed command.

(2) By the nature of the mission of the 103rd Engr Co (CS) its construction effort has been limited to the support of the 159th Engineer Group with hot mix asphalt and quarry operations and support by the Euclid Dump Truck Platoon.

(3) At the beginning of the reporting period the 103rd Engineer Company (CS) produced asphalt in one standard Military 80-120 ton per hour Barber Green continuous mix asphalt plant, on a one shift basis, in support of the 169th Engineer Battalion paving operations. Due to lack of parts one asphalt plant has not been run this period.

(a) Paving has been accomplished during the reporting period at the following locations:

QL-1  
506th Field Depot  
208 yard road  
MSR-25  
Long Thanh North

(b) Asphalt Operations:

1. Accumulative data during the period is:

Tons Mix produced - 13,450  
Gallons AP-3 used - 159,484  
Aggregate 3/4" (-) used - 2,976 tons  
Aggregate 1/4" (-) used - 4,980 tons

2. Quarry Operations: The Quarry is located at the Bien Hoa Air Base. Total production for this reporting period was 26,542 cubic yards.

3. Self Help Construction: Aggregate storage bins were constructed at the Asphalt Plant on a self help bases.

h. 617th Engineer Company (PB) conducted the following activities during this period:

(1) During the reporting period, the 617th Engineer Company (PB) remained at Long Binh, Vietnam. The major activities of the unit included: Combat support to Second Field Forces Vietnam (II FOFCEV) and IV ARVN Corps, Bridge upgrading (LOC's), and dump truck support to 159th Engineer Group units.

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(2) The unit was transferred to the operational control of the 46th Engineer Battalion, on 17 October 1968 and was reorganized under MTO&E 5-77G by General Order Number 548, DA, HQ, United States Army Pacific, changing authorized strength to 3 Officers, 1 Warrant Officer, and 122 Enlisted Men.

(3) During the period, the unit executed four operational support missions, which are listed below:

(a) Operation Vung Tau Bridge, conducted in support of the 1st Australian Task Force, began on 4 Aug 68 and terminated on 7 Aug 68. One hundred twenty feet of double-single Bailey bridge was constructed in two sections of sixty feet each, breaking the bridge over an intermediate pier.

(b) Operation QL-20 Bridge, conducted in support of the 159th Engineer Group, began and terminated on 12 August 1968. Thirty feet of Double-single Bailey bridge was constructed to replace a rain damaged arch bridge.

(c) Operation Song Boung Bridge, conducted in support of the 92nd Engineer Battalion, began and terminated on 20 Sep 68. One hundred twenty feet of double-double Bailey bridge was constructed to by pass a bridge blown by the Viet Cong on QL-15.

(d) Operation Camp Viking Bridge, conducted in support of the 86th Engineer Battalion and the 7th ARVN Engineer Battalion, began on 16 Oct 68 and terminated on 19 Oct 68. One hundred feet of triple-single Bailey bridge was constructed to replace a Class 15 Eiffel bridge.

(4) During the reporting period, the unit hauled 810 cubic meters of sand and gravel to the Blackhorse concrete batch plant in support of the 31st Engineer Battalion (Combat), 465 cubic meters of base course to the 169th Engineer Battalion for use in LOC maintenance on QL-20, 1455 cubic meters of 6"(-) rock to the Bien Hoa Ammo Pier in support of the 92nd Engineer Battalion, and 670 cubic meters of rock for use in LOC maintenance and construction to Tan An in support of the 15th Engineer Battalion, 9th Infantry Division, and 4,610 cubic meters of rock and laterite to Saigon, Hoc Mon and Cat Lai in support of the 46th Engineer Battalion.

(5) An extensive program for cross training of mechanics has been conducted in the unit Motor Pool. A TAEMS clerk is presently receiving on the job training and is scheduled to attend formal classes available in the near future. OJT Training is also being conducted for personnel to fill the critical vacancies of the company clerk, crane operators, and armorer.

(6) In addition to the bridging operations conducted with the 1st Australian Task Force and the 7th ARVN Engineer Battalion, the unit began Bailey bridge training for the RTAVF Engineer Combat Battalion, Thailand. Training commenced on 28 Oct 68 and is scheduled to be completed on 6 Nov 68. Three platoons will receive three days training each.

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i. Task Force Builder, the Revolutionary Development Support project in the Mekong Delta, conducted the following activities during this period:

(1) During the past quarter, Task Force Builder completed four more structures for the people of Long An Province. As the period closes another school is 99% complete and the entire project as directed by 159th Engineer Group is nearing completion.

(2) On 20 September the finishing touches were put on the village office in Cau Tram. This building provided much needed space for the village officials to adequately administer to the needs of the people. Also on 20 September, a nearby school in the hamlet of Xom Moi was completed. Three more classrooms were thus added to the long list of educational facilities already completed by Task Force Builder.

(3) Two more school buildings, (on the road between the larger towns of Can Giuoc and Can Duoc) were completed on 11 October. These two buildings include a four room school in the hamlet of Cho Tram and a two room structure in Lang My. Since these hamlets have more teachers than classrooms, these schools will be put into service as soon as the furniture is installed. The 46th Engineer Battalion carpenter shop is rushing to complete the required desks for the students and teachers.

(4) In addition to the above scheduled projects, Task Force Builder has been able to utilize temporarily idle equipment to improve the lines of communication within the Thanh Duc and Can Duoc districts. One section of Highway 18 had been closed for three years due to the VC inflicting damage to the road. Working in conjunction with USAID, 1,500 cubic meters of laterite were placed and compacted, thus returning the entire road to a useful condition. The VC also cratered a 14 foot section of Highway 5A during the last quarter. Five loads of laterite were required to fill the gap, and after appropriate compaction, the road was also reopened.

(5) A valuable civic action project was also accomplished during this period for the citizens of Can Giuoc. Working with the local ARVN regiment, 44 foot by 80 foot market place was constructed in the center of town. Task Force Builder provided a cement mixer to place the pad, and the men of the Battalion also assisted in the assembly and erection of the trusses for the roof.

(6) In the coming quarter, the two schools and a teacher's house remaining on the schedule will be completed. After an extremely productive and successful year, the task force should be returning to Long Binh Post.

### j. Personnel, Administration, Morale, and Discipline.

(1) The 46th Engineer Battalion is organized under TO&E 5-115G. The 103rd Engineer Company (Construction Support) organized under TO&E 5-114D, was attached by 159th Engineer Group General Order Number 34, effective 1 January 1968. The 617th Engineer Company (Panel Bridge) organized under TO&E 5-77G, was attached by 159th Engineer Group General Order Number 13, effective 1 July 1968.

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(2) The battalion has had a total of 401 men processed either in or out of the battalion. This is broken down into 240 losses and 161 gains over the quarter ending 31 October 1968. The rotational hump for the next three months will not exceed the USARV established maximum of 15% in any one month. (The rotational rates are forecast as 6.7% for November, 5.5% for December, and 13.3% for January).

(3) Morale has kept its steady pace upward this past quarter. This can be attributed to many factors. All of the battalion's personnel in the Long Binh area live in tropical frame buildings. A central water distribution system has been completed for all showers and mess halls to provide hot and potable water. The awards program has been emphasized over the past quarter and a total of 50 medals were presented in this battalion between 1 August 1968 and 31 October 1968. The battalion's effort is continuing to be expanded off Long Binh Post. Personnel have a greater sense of accomplishment while working in outlying areas and on Revolutionary Development Projects in the Mekong Delta. The men of the battalion are extremely eager to participate in those projects involving contact with the enemy. Their morale has risen remarkably when they are committed to projects which have a sense of urgency and place them where the action is. A further indication of the morale is the fact that a total of 184 extensions were approved over the quarter as of the end of the reporting period, the battalion had a total of 284 men who are presently on extension.

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### Section 2, Lessons Learned: Commander's Observation, Evaluations, and Recommendations.

a. Personnel - None

b. Operations

#### (1) Fender Support for 5 Ton Dump Truck

(a) OBSERVATION. This unit has made many long distance trips over badly rutted roads. The constant pounding and vibration has caused the fenders of 5 ton dump trucks to crack and the fender mounting bolts to loosen.

(b) EVALUATION. The problem was solved by attaching one end of a two foot length of 1" chain to the upper outside portion of the fender and fastening the other end to the upper cab next to the mirror mounting bracket bolt. In this way the downward flexing of the fender is stopped and the fender mounting bolts are subject to less vibration and consequently remain tight.

(c) RECOMMENDATION. As a temporary measure to prevent cracking of dump truck fenders, a two foot length of chain can be used as a brace to stop the constant vibration imposed by traveling over rutted roads.

#### (2) Precast Headwall Footers

(a) OBSERVATION. Because of the depth of the stream (5 to 6 feet) and the velocity of the water, it was impractical to place concrete footers for a culvert headwall by normal means.

(b) EVALUATION. The concrete footers were precast in the company area and hauled to the job site. Using a 20 ton crane, the 6' x 6' x 12" footers were placed in the stream bed. The footers were precast with #6 reinforcing bars protruding from the top to insure that a strong bond would result between the headwall and footer.

(c) RECOMMENDATION. Precast concrete footers can be used as an expedient means when site conditions make it impossible to place concrete by normal methods.

#### (3) Utilization of Civilian Milli-Second delay Blasting Caps

(a) OBSERVATION. Blasting operations within this unit's Rock Quarry have long been unsatisfactory when military milli-second blasting caps were used. Regardless of the bore-hole pattern used or the depth of the hole or stemming, the surge pile always produced large quantities of over size rock which required excessive secondary blastings.

(b) EVALUATION. It was found that utilization of civilian milli-second delay caps produced a better blast effect than the military caps. In as much as the delay is less in the civilian caps, the resulting detonations occur rapidly enough so as to reinforce the shock-wave thus producing a better break up within the blasting pattern.

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(c) RECOMMENDATION. Civilian milli-second delay blast caps should be used in place of military blasting caps.

### (4) Flood Light Modification


(a) OBSERVATION. Flood lights used for bridge pier protection lighting have a tendency to build up condensation within the fixture and short out.

(b) EVALUATION. The problem of condensation within the light fixture was solved by drilling two small holes on the top and bottom of the reflector. This allowed the condensation to drain out and air to flow into the fixture.

(c) RECOMMENDATION. By drilling two holes in the reflectors of flood lights, the problem of condensation and shorting out is eliminated.

- c. Training - None
- d. Intelligence - None
- e. Logistics - None
- f. Organization - None

1 Incl  
Organizational Structure

  
PENDLETON A JORDAN III  
LTC, CE  
Commanding

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AVBI-08 (13 Nov 68) 1st Ind  
SUBJECT: Operational Report - Lesson Learned, RCS CSFOR-65(R1) for  
Quarterly Period Ending 31 October 1968.

DA, HEADQUARTERS, 20th Engineer Brigade, APO 96491 11 DEC 1968

TO: Commanding General, United States Army Vietnam  
ATTN: AVHLM-MO, APO 96375

1. Submitted in accordance with USARV Regulation 525-15, dated 13 April 1968.
2. Subject report for the 46th Engineer Battalion (construction) has been reviewed and is considered adequate.

FOR THE COMMANDER:

1 Incl  
wd 1, 2, 4, 5, 6

  
RICHARD E. TAYLOR  
1LT, ACC  
Assistant Adjutant



AVHGC-DST (13 Nov 68) 2d Ind

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65) for Quarterly  
Period Ending 31 October 1968

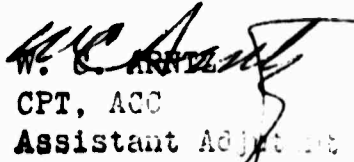
HEADQUARTERS, UNITED STATES ARMY, VIETNAM, APO San Francisco 96375

TO: Commander in Chief, United States Army, Pacific, ATTN: GPOP-DT,  
APO 96558

1. This headquarters has reviewed the Operational Report-Lessons Learned for the quarterly period ending 31 October 1968 from Headquarters, 46th Engineer Battalion.

2. Reference item concerning utilization of civilian milli-second delay blasting caps, page 15, paragraph 2b(3). Concur. Military delay blasting caps are available only in 1 second, 1.18 second, 1.35 second, and 1.53 second delay options. These delays are much greater than those available in commercial caps, and do not produce good rock breakage in quarry operations. Commercial caps are being procured in the 25, 50, 75, 100, 150, 175, and 200 milli-second delay categories based on 18th and 20th Engineer Brigade requirements. Recently, 115,000 commercial caps were received and are being used in quarry blasting operations by the Engineer Brigades. Recommend higher headquarters consider adoption of milli-second delay caps as military standard.

FOR THE COMMANDER:

  
W. C. ARNOLD  
CPT, ACC  
Assistant Adjutant General

Cy furn:  
HQ 20th Engineer Bde  
HQ 46th Engineer Bn

GPOP-DT (13 Nov 68) 3d Ind

SUBJECT: Operational Report of HQ, 46th Engr Bn for Period Ending  
31 October 1968, RCS CSFOR-65 (R1)

HQ, US Army, Pacific, APO San Francisco 96558 30 JAN 1969

TO: Assistant Chief of Staff for Force Development, Department of the  
Army, Washington, D. C. 20310

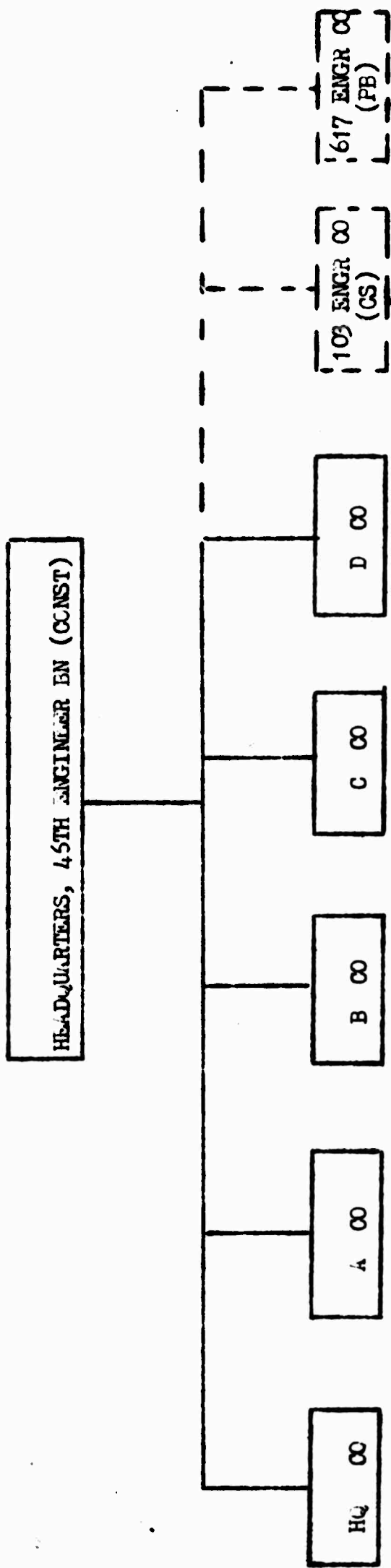
This headquarters has evaluated subject report and forwarding indorse-  
ments and concurs in the report as indorsed.

FOR THE COMMANDER IN CHIEF:



C. L. SHORTT  
CPT, AGC  
Asst AG

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